TRIP REPORT
Nez Perce NF, Elk City Ranger District
November 9, 1993

On November 9, 1993, Jane Taylor and I met with Kara Stockwell, forester, and John Gubel, supervisory forester, to visit a stand for which Kara is preparing a prescription as part of her CEFES training requirements. We were there because of Kara's concern with root disease in the stand.

The main overstory tree species in this stand (stand #811-772) are Douglas-fir, lodgepole pine, and western larch, with a mix of grand fir and a few scattered Engelmann spruce. The understory is a mixture of mainly grand fir and Douglas-fir, a few Engelmann spruce and a scattering of lodgepole pine in the openings. The stand encompasses approximately 30 acres on a very gentle southwest facing slope at about 4,900 feet elevation, and is bordered on the east edge by forest road 443. The habitat type ranges from grand fir/Queen's cup bead lily to grand fir/wild ginger. The average age of the overstory is 70-75 years and likely originated from a stand replacement fire.

We found armillaria root disease (Armillaria ostoyae (Romagnesi) Herink) throughout the stand, with one large pocket (1/4 to 1/2 acre) on the south end. In this pocket, the only live overstory trees left are western larch and a few scattered lodgepole pine. Armillaria is actively attacking and killing Douglas-fir and grand fir in all size classes. It is also attacking western larch and lodgepole pine, but these species are attempting to callous off the attacks and only a few trees are succumbing to the disease.

Outside of this large pocket, most of the grand fir and Douglas-fir have decent crowns and are showing very few obvious symptoms of infection, although many are infected with armillaria. A few Engelmann spruce are also infected with armillaria, but crown symptoms and mortality are limited to a few understory trees. Many grand fir throughout the stand have their tap roots rotted off. Although armillaria will cause such an effect, much of it appears to be caused by annosum root disease (Heterobasidion annosum (Fr.) Bref.). Root collections brought back to the lab did not reveal the presence of annosum, but the disease is prevalent in several grand fir stands a few miles away. It is very likely also present in this stand and may become more obvious as the stand ages.

Root disease is less prevalent in the middle of the stand. The main species here is lodgepole pine, which is more tolerant of armillaria and may be hiding the presence of the fungus. We also found another root disease in a dead western larch in a marshy, wet area. It appeared to be Perenniporia subacida (Pk.) Donk. This fungus is recognized as a secondary root disease, and likely attacked the tree because it was stressed from the high water table.

Other insect and disease items noted in the stand include old mountain pine beetle (Dendroctonus ponderosae Hopkins) attacks, with some current, unsuccessful attacks. Some of the lodgepole pine also have stalactiform blister rust (Cronartium coleosporioides Arth.), which causes branch mortality, bole deformity, and sometimes individual tree mortality. It is more of a problem in pure lodgepole pine stands, and is not a real management concern in this stand. The lodgepole pines throughout the stand are also suffering from varying degrees

of lodgepole pine needle cast (Lophodermella concolor (Dearn.) Darker). This foliar disease has been severe enough over consecutive years to cause mortality in some of the understory lodgepole pine. Overall, the lodgepole pine appeared to be competing poorly with the other overstory tree species, and many have small, thin crowns. We also noted dead tops and scattered branch mortality in the grand fir and Douglas-fir caused by old western spruce budworm damage, but we found no evidence of any recent damage.

Older fire scars are apparent on some lodgepole pine and a few western larch. One lodgepole pine had been felled earlier in the season and we aged the fire scar at approximately 36 years old, which means a fire scarred the tree around 1957.

Armillaria root disease is the most apparent concern in this stand. Armillaria affects many species of conifers in the Region, but Douglas-fir and grand fir are considered the most susceptible species. It is a native pathogen that occupies a site for a very long time. It survives in old stumps and roots for many years and spreads from these food bases to the roots of live trees either through direct root contact or by rhizomorphs.

Armillaria and other root diseases are native pathogens in ecosystems on the Nez Perce NF (and other areas in the Region). The presence of root disease in this stand lowers the overall productivity of the site due to continuous mortality from root disease. This fact needs to be considered when developing long-term management strategies for the stand and for the landscape. Conscientious planning may mitigate the effects from root disease, but it is not possible nor desirable to eradicate root disease from the site.

Partial harvesting can increase the severity of root disease, especially if the leave trees are the more root disease **susceptible** tree species. If partial harvesting is utilized in this stand, then it would be very prudent to select the more root disease **tolerant** species on the site as leave trees, which include western larch and lodgepole pine. Although the lodgepole pine appear to be declining, a few of the better looking trees may be able to respond to opening up the canopy. Even if they are unable to respond, they will still provide some diversity in the stand. It may be worthwhile to leave some of the healthier looking grand fir and Douglas-fir, but favor the grand fir over the Douglas-fir. These trees will likely succumb to root disease (especially the Douglas-fir), but they may live long enough to provide some tree species diversity in the stand and could also be replacement snags. It is important to realize that the effects from root disease generally increase with increasing proportions of Douglas-fir and grand fir leave trees. A proportion of 30 percent or less grand fir/Douglas-fir is a good rule of thumb. An example of what might be expected from leaving Douglas-fir trees in the residual stand can be found further up forest road 443 in the old Limberluke timber sale. A unit in the sale was cut for a Douglas-fir seed production area. At the time the unit was marked and cut, the leave trees appeared to be very healthy. Shortly after the unit was harvested, they still looked good with only a few trees dying. Now the leave trees are declining even more rapidly and dying from root disease.

Clearcutting the stand can provide the opportunity to convert the stand to a higher proportion of root disease tolerant species, and thus decrease the effects from root disease. This may be desirable in light of how much root

disease is present in the stand and the surrounding area. Although clearcutting may be a desirable management alternative for this stand, it may not be a desirable alternative within the context of the whole landscape.

Annosum root disease also needs to be considered. In 1991, I studied this pathogen in stands just up the road from Kara's stand. I looked at the incidence of the disease in an uncut stand and a neighboring clearcut stand, and concluded that the incidence of the disease significantly increases with clearcutting, although it's not known if this translates into an increase in mortality. We are exploring opportunities to reduce the spread of the disease by treating stump surfaces, but we expect the payoffs to be minimal due to the wide distribution of the disease in unentered stands. That is to say, it's already present under natural conditions at low levels, so preventing stump infections may or may not be beneficial.

Root disease in this stand appears to be within the range of natural variability for this area. It is important to realize that root disease is a natural component of these ecosystems and that the presence of root disease is going to reduce the expected productivity.

We appreciated the opportunity to work with Kara and John in evaluating the root disease in this stand. It is a pleasure to assist people who work so hard at making sound management decisions. If we can be of any further help, please don't hesitate to give us a call.

/s/ Blakey Lockman

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/s/ Jane Taylor

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Reply To: 3420 **Date:** February 10, 1994

Subject: Service Visit - Elk City RD

To: Forest Supervisor, Nez Perce NF

Blakey Lockman and Jane Taylor were invited to review the root disease condition in Kara Stockwell's CEFES certification stand on the Elk City Ranger District. On November 9, 1993, they met with Kara and John Gubel to visit the area. While there, they discussed the present condition of the stand and possible management alternatives.

Root disease is prevalent throughout the stand, but at a level we consider within the range of natural variability. Although all species in the stand are being affected to some degree, the tree species most severely affected are Douglas-fir and grand fir. It is important to realize that root disease is a natural component of ecosystems on the Nez Perce National Forest, and that the presence of root disease is going to reduce the expected productivity of the site.

The accompanying report describes the condition at the site and possible management alternatives. I hope this information will be helpful in developing realistic management alternatives for the site. Please don't hesitate to contact our office again if further assistance is required.

/s/ Bill Boettcher

WILLIAM W. BOETTCHER
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Enclosure

cc:
K.Stockwell:R01F17D08A

B.Lockman:bl:lh:2/8/94
I concur:B.Lockman:2/9/94
I concur:J.DEWEY:2/10/94